



Natural Science Collections Facility

SOUTH AFRICA

Half-year Report to the Department of Science, Technology & Innovation

1 April to 30 September 2024



science & innovation

Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA

SANBI

Biodiversity for Life

South African National Biodiversity Institute



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1. Rationale and Scope

- Research collections are essential for all countries with scientific enterprises, and they should be considered as large scale, global research infrastructure. South Africa has an estimated 20 million objects or specimens representing over 100,000 different species in natural science collections.
- Natural science collections and the data associated with these are a crucial resource for a wide range of society both nationally and globally, including researchers, environmental assessment consultants, land use managers and planners, farmers, bioprospectors, students, learners and decision-makers.
- South Africa's natural science collections are managed in a highly fragmented and largely isolated environment and there is no common strategy or approach to research which means that their full potential as a national research infrastructure is not being realised. In addition, the specimen data are largely inaccessible, which causes delays in decision-making or poor decision-making relating to sustainable development and sustainable harvesting of natural resources, both of which have considerable economic impacts. Inaccessible data also limits their use in large scale, multi- and trans-disciplinary studies.
- The NSCF aims to address this situation, which will have positive impacts on research in numerous fields, on the economy through providing critical information for agriculture, fisheries, pest control, alien invasive management, natural products, and on society which benefits from biodiversity in virtually all aspects of life.
- The NSCF is a distributed network of institutions that hold natural science collections, with a Central Co-ordinating Hub hosted at SANBI in Pretoria. There are currently 18 institutions participating in the NSCF, including three national and five provincial museums, one municipal museum, four science councils, four universities and one citizen science organisation. SANBI is responsible for the overall implementation of the project plan and management of the budget allocation for the NSCF from the DSI. The individual institutions continue to be supported by their existing structures, and continue to report to these but will collaborate to meet the objectives of the NSCF, and will receive support in order to enable this.

Expected deliverables, outputs, outcomes and impacts

Deliverables specified in the Agreement between the Department of Science Technology & Innovation and SANBI for the NSCF from 2024/25 to 2028/29.

Deliverables	Outputs	Outcomes	Impact
Publication of methods and approaches used in 2023 collections assessment	Papers published in peer reviewed journal	Sharing of knowledge and tools developed by NSCF internationally	Recognition of NSCF and South Africa for innovation in collection assessment
Three to six orphan and at risk collections transferred to secure environments according to the NSCF guidelines	Well managed, secured and accessible collections of biological specimens; secured for long term use.	Increased research and education outputs in a range of fields, by national and international scientists currently and into the future.	Increased knowledge of South Africa's past and present biodiversity for the benefit of all of society, including future generations; International recognition for SA collections
Online tracking tool for status of collection management and curation - ongoing updates by collection institutions according to progress on meeting standards set in NSCF Manual	Information available for collection management and curation activities and targets in annual and three-year plans of institutions and individual workplans. NSCF Hub staff able to identify problem areas for interventions (training, investment or other forms of support).	Efficient allocation of resources to address priorities. Increased accountability.	
Virtual museum includes type specimen images (>3000 specimens); herbarium specimen images (>1.5 million); specimen data sets (15 collections); and archival documents (1000) for plant, animal, fungi and fossil groups	Integrated and openly accessible images of specimens and digitised archival documents used by researchers, postgraduate students, undergraduates and learners nationally and globally.	Increased research and education outputs in a range of fields. Reduced impact of use on specimens and documents which results in longer term preservation.	

Review of status of collection data sets (extent, quality and completeness; extent of publication on GBIF)	Information available for data management and digitisation activities and targets in annual, three-year and individual workplans. Informed decisions for NSCF plans.	Increase in extent and quality of data available for research and decision-making. More efficient use of resources by institutions and NSCF to address priorities.	Improved quality of biodiversity assessments and decision-making to mitigate development impact on biodiversity; sustainable development. Increased knowledge generation in a wide range of fields including biodiversity conservation, climate change and mitigation; and improved conservation assessments
Tracking tool for status of specimen data: extent of digitization, verification, upgrading and publication on GBIF			
Expansion of collection data sets: data for a minimum of 300 000 specimens captured	Specimen data accessible globally for research, decision-making.	Increased use of collection data for research and decision-making.	
Publication of at least 15 new collection data sets on GBIF			
At least 3 Communities of Practice established for collection management and curation; data management, with regular sessions focused on specific topics identified in the collections assessment	Collection based staff, including interns and postgraduate students upskilled. NSCF network strengthened.	Upskilled and qualified collections-based staff; greater effectiveness and efficiency in curation and management of collections. Sustainable network developed with increased collaboration and sharing of knowledge and resources.	Improved capability of institutions. Secured collections used globally by scientists to address critical issues related to biodiversity.
Attendance by staff at a minimum of 6 courses in collection management / curation and data management			
Participation in a minimum of 6 international conferences and workshops on natural science collections and data			
Three NSCF Forums to bring all collection staff together to share knowledge and experience			

Organisational development and transformation sessions run with a minimum of 6 institutions; and with the NSCF Hub team	<p>Institutional plans for collection management and curation, data management and research.</p> <p>Improved team coherence and effectiveness within institutions and the NSCF Hub.</p>	<p>Improved standard of collection management and curation; data management.</p> <p>Improved efficiency and productivity; use of scarce resources.</p>	Collection management and curation, data management, research improved in institutions in both short and long-term
Emerging leaders development: at least 6 sessions run	At least 30 young staff working in collections as researchers, curators or technicians developed to play leadership role.	<p>Improved succession in institutions.</p> <p>Improved productivity of staff in institutions.</p> <p>Youth empowerment.</p>	
Report and publication on the impact of collection-related research and data in terms of the value chain	<p>At least 1 paper published.</p> <p>Identification of mechanisms to improve knowledge and data flows.</p>	<p>Improved understanding of the value of collections and associated data.</p> <p>Increased accessibility of knowledge and data from collection-based research.</p>	Improved evidence-based conservation and sustainable use of biodiversity
NSCF website provides materials promoting the value of natural science collections	<p>Video showing collections, iconic specimens.</p> <p>Downloadable showcase documents explaining value of natural science collections.</p>	Improved public understanding of biodiversity, its importance for human well-being and for national and cultural identity.	Biodiversity and collections viewed as national assets and treasures of value for science and decision-making; social cohesion; increased interest in life sciences by learners

Duration of the contract

The NSCF falls within the South African Research Infrastructure Roadmap (SARIR) programme of the Department of Science, Technology & Innovation. The South African National Biodiversity Institute (SANBI) has been contracted by the DSTI to co-ordinate the implementation of the NSCF since 2017. A new agreement between SANBI and the DSTI for continued implementation of the NSCF was signed in October 2024 with an allocated budget of R56, 532,276 over a 3 year period (2024/25, 2025/26 and 2026/7).

2. Aim and objectives

The overall aim of the NSCF is to enable sustainable, enriched life on Earth by working as a dynamic network that values the African context, **to promote, upgrade and make accessible natural science collections and data for research and services.**

In order to realise this aim, the NSCF has the following overall goals:

NSCF goals, progress and future plans

1. Estimated 18-20 million **preserved plant, animal, fungi and fossil specimens** collected over the last 200 years, **well curated, and accessible either virtually or physically to the global research community for research** in biological, environmental and palaeosciences, for contributing to documenting past and present biodiversity, understanding global change impacts on species and biological communities, and possible mitigation and adaptation mechanisms.

2024/25 – 2028/29

- The methodology and approach for the collection assessment are novel and could be used internationally by other research collections or network initiatives (there is currently no standard system for assessing management and curation status). This will be published in appropriate international journal/s.
 - The assessments have revealed some collections that remain at significant risk of deterioration and loss. There are a number of factors that are responsible for this situation and in some cases the collections or at least the most significant specimens should be moved to more secure institutions. This will require negotiation and support for packing and moving the collections and their accessioning at the receiving institution. Guidelines for decision-making for moving orphaned collections are required, including resourcing of recipient institutions and legal considerations.
 - Support will be provided to institutions for addressing gaps in documentation (policies, procedures, workflows and standards) and for some of the curation processes. This support will be in the form of a number of Communities of Practice, co-ordinated and facilitated by the NSCF Hub together with staff from partner institutions.
 - Interventions in the form of guidance and support for aligning plans with the gaps identified are planned, with the assistance of organisational development and transformation facilitators.
2. The data from the specimens (what it is, where it was collected, when it was collected as a basic minimum) assembled into **databases that are openly accessible in an integrated way for researchers, practitioners involved in monitoring and assessing the status of biodiversity (eg. threatened species assessments, alien invasive species risk assessments, environmental impact assessments for various forms of land use change and development), and decision-makers involved in authorisations for land use change (eg. mining, agriculture), development, and harvesting quotas (eg. medicinal plants, fish).** The data are currently incomplete (only an estimated 50% of specimens have label data captured in databases), with a large number of specimens for which data have not been captured (estimated 6 million, mostly insects) and gaps in the data for which there are digital records.

2024/25-2028/29

- We have realised that the process of transcribing/ digitising specimen data using an NSCF appointed team of data technicians was inefficient in relation to the extent of the work and the salary costs. Over the next year the **use of**

automated technologies and machine learning will be investigated in collaboration with international teams and if feasible, implemented to increase specimen data sets over the subsequent five years.

- A **detailed analysis of the status of existing specimen data sets, the publication of these and use of published data** will be carried out to inform data mobilisation and publishing activities, as well as the development of a progress tracking tool.
- More **targeted and strategic data mobilisation and publishing activities** will be carried out depending on user needs (e.g. species threat assessments and data for the Department of Fisheries, Forestry and Environment's screening tool, projects on food and medicinal plants).

3. **Establishment of a Virtual Museum that provides online access to images of specimens from the collections of all participating institutions, specimen data sets and archival documents** such as field notes of historic collectors. Researchers, postgraduate students, EIA practitioners, threatened species and alien invasive species assessors, conservation authorities, and learners will be able to access the Virtual Museum for a range of projects.

2024/25 – 2028/29:

- The Living Atlas software which is open source will be used to set up the platform.
- Specimen data sets, specimen images and digitised documents will be uploaded and made accessible on an ongoing basis.
- Herbarium specimen imaging will continue and completion of all of the medium sized and smaller herbaria is expected by the end of 2026.
- SANBI is working with a conveyor belt system for imaging of the two largest herbaria (National and Compton Herbaria) and they are also expected to complete the work by the end of 2026. This system will then be moved to herbaria in other African countries.
- All newly collected specimens will be imaged on a regular or ongoing basis depending on the availability of equipment.
- Imaging of Karoo fossil and vertebrate (mammal, bird, reptile, amphibian and fish) type specimens will continue and it is expected that this will be completed by the end of 2026.
- Technologies for mass digitisation of millions of insect specimens need to be explored and potentially implemented from 2026/27.
- Digitisation of historical accession registers / catalogue books, field notes and research notes related to collections will continue and priority documents will be completed by the end of 2028.

4. **Research outputs and translational research: understanding the use, impact and value of natural science collections**

2024/25 – 2028/29

- Over the next three years we intend **investigating how the taxonomic outputs are used by other researchers and for informing policy and decision-making and how knowledge flows along the value chain**. This is essential to promote an understanding of the value of the collections as well as for addressing any breaks or blockages in the chain. Partnerships with institutions or units that have experience in bibliometrics and scientometric analyses will be necessary for this research. We will also analyse the use of collection data sets for South African biodiversity accessed on GBIF.
- The report and publications from the analyses will include **recommendations for increasing access, uptake and use of publications and data for enhancing impacts and benefits to society** and these will be implemented in from 2027.

- The NSCF Hub will continue to co-ordinate **the use and outputs from the collections and data** and will need to develop mechanisms to track use of the Virtual Museum resources.
- **Data and specimen identification services will be provided to requesters** on an ongoing basis. This includes provision of data for conservation and threat assessments for species, for the DFFE Screening Tool for land use decision-making, and for environmental impact assessments. Identification of biological material is carried out for a wide range of clients. These services are generally demand driven rather than being initiated by the collections community.

5. Outreach and communicating the value of natural science collections

The natural science collections are generally inaccessible to the general public, and few people, including decision-makers are aware of their existence or extent or value. The collections are often perceived as colonial relicts or as curiosities rather than as critical research infrastructure and a tangible, irreplaceable reference for the country's biodiversity.

2024/25-2028/29

- Over the next six years communication and outreach activities will be more targeted and strategic to **promote understanding of the value of collections to society**. The information presented will be audience specific, relevant to the African context, promote indigenous knowledge systems and contribute to public understanding of science and social cohesion. The outcome of this goal will have relevance beyond South Africa because many countries face similar challenges related to the lack of awareness of the value of the collections posing a threat to the sustainability of natural science collections.
- Some of the specific activities and outputs include the development of videos of collections and specimens of scientific or cultural significance for distribution on the Virtual Museum and other appropriate platforms, compilation of recommendations for museum displays on the collections and biodiversity to increase relevance to the African context and increasing public engagement in this topic.

6. African and international engagement

The value of international engagement through attending and presenting at conferences and workshops and participation in international bodies has become evident over the last few years, even though this has been predominantly virtual / online. We will increase international engagement through participation in the Society for the Preservation of Natural History Collections, Taxonomic Data Working Group, and iDigBio conferences and workshops, participation in the Specify Consortium Board of Directors and scientific and technical advisory boards.

We have not previously engaged with natural science collection institutions in other African countries. This was largely because the focus over the last six years has been on establishing the NSCF structures and having tangible products and skills that can be shared and have a meaningful impact. Curation and research staff at natural science museums in other African countries will be contacted to consider opportunities for knowledge sharing and collaboration. The possibility of an online African natural science collections symposium, participation in various NSCF online activities such as the collection management and curation course, and the Communities of Practice will be explored.

In order to achieve these objectives the following enabling strategies will be critical:

Strategy 1. Staffing and capacity development

- The NSCF has run training in the use of Specify software for managing collections and data, and a higher level mentorship programme for staff. The NSCF sponsored 17 staff to attend a customised Data Management course presented by the University of Pretoria. Various other workshops related to data management and use have been run by the NSCF or participation in workshops organised elsewhere has been supported. This type of work will continue.
- The NSCF collection management and curation course material will be reviewed and refined and be available online for independent study. More focussed shorter courses will be offered or participation supported over the next six years.
- The Community of Practice approach will be used for increasing capacity for collection and data management and curation. The NSCF will facilitate the establishment of these sessions.
- Emerging leaders from the participating institutions have been identified and a range of activities will be run to support the development of this component of the collections community.
- The NSCF Hub team includes 17 staff, 16 of who are on short term contracts. Ensuring team cohesion, staff well being and ongoing development is critical for the successful implementation of the NSCF.

Strategy 2: Transformation and organisational strengthening to enable the long-term sustainability of the collections and associated research to benefit society

The initial aim of the transformation process was to build a sustainable and functional NSCF network, with full participation and collaboration across institutions, recognising the African and South African context.

We have run a facilitated transformation and organisational strengthening process over the last six years. There was considerable focus on institutional leadership and this has had mixed impacts which is not unexpected given the diversity of governance structures, cultures, size and staff complements. The challenges that need to be addressed are complex and so the transformation and organisational strengthening work will continue but with a more targeted approach.

The collections assessment that was carried out in 2023 was designed as a transformative change process that included strengthening the NSCF network, information sharing, capacity development through engagement with the content of the NSCF Collections Management & Curation Manual and organisational development. Through the assessment process, the reports and regional sense-making workshops, some of the underlying factors that contribute to institutional challenges or achievements have become evident.

- The focus of the transformation and organisational strengthening process for the next five years will be on supporting selected institutions with specific challenges that were identified during the collections assessment process, and supporting institutions with planning and implementation for collection management and curation.
- Communication across the institutions includes regular use of a WhatsApp group and a Facebook page, which will both continue.
- The NSCF Forum will be held every 18 months but this is likely to be a virtual event to reduce the costs.

Strategy 3: Contributing to the identification of strategies and models that will ensure financial sustainability of the natural science collections.

As allocations from government and higher education institutions continue to decline, pressure to increase efficiencies is increasing. There are limited opportunities for commercial activities associated with the collections, but sharing knowledge and resources across institutions, and potentially rationalising some collections will be continuously investigated over the next six years.

3. Progress: 1 April to 30 September 2024

Strategic Objective	2024/25 Deliverables	Progress 1 April to 30 September 2024
1. Securing Collections	- Review of overall collections assessment report to identify main interventions required	Document with gaps and recommendations for each institution compiled, appropriate interventions to be identified in third quarter.
	- Develop guidelines for decision-making on transfer of orphaned/at-risk collections	Guidelines document on the transfer of orphan, at-risk and neglected collections is under development, to be completed by December 2024.
	- Establishment of Communities of Practice to support institutions in documentation	Launch of Communities of Practice (CoP) to support institutions took place on 28 August 2024. Subsequent sessions to be held every 2 weeks.
	- Publication in international journal on methods for collection assessment	Manuscript drafted on collections assessment results. Paper on collections assessment methods planned.
	- Transfer of orphaned collections to secure institutions	Process for transfer of McGregor Museum Mollusc collection to KwaZulu-Natal Museum started. Planned relocation: Malawi cichlid collection from Penn State University in the USA to SAIAB.
	- Development of a tool for institutions to track improvement of collection management and curation practice on an ongoing basis	Tracking tool developed and in process of being rolled out to institutions.
2. Upgrading and Expanding Databases	- Investigation and piloting of optical text recognition for digitisation of specimen label data	University of Michigan platform (Vouchersion) is under ongoing development. Implementation and testing with the technician team is planned for third quarter.
	- Review and analysis of status of specimen data sets	Work plan developed. Work on this target will resume upon the completion of the tracking tool roll-out in October. Additionally, an abstract has been written and submitted for a talk at the forthcoming Herpetological Association of Africa Conference in November. This talk will discuss aspects of herpetological data from museum collections and will be expanded to include all vertebrates for the purpose of this target.

Strategic Objective	2024/25 Deliverables	Progress 1 April to 30 September 2024
	-Review of existing data published on GBIF to assess extent and quality of data	Work plan developed. Work on this target will resume upon the completion of the tracking tool roll-out in October. Additionally, an abstract has been written and submitted for a talk at the forthcoming Herpetological Association of Africa Conference in November. This talk will discuss aspects of herpetological data from museum collections, the representation of museum data on publicly accessible data aggregation platforms such as GBIF, and will be expanded to include all vertebrates for the purpose of this target.
	- Establishment of a Community of Practice for data management	Communities of Practice framework launched in August 2024, first session on data management planned for November 2024.
3. Virtual Museum	- Setup online Virtual Museum architecture	Work plan for architecture set up completed, work to commence in October 2024.
	- Population of Virtual Museum with images and datasets	To commence once architecture set up is complete.
	-Specimen imaging: type specimens: 800 vertebrates and fossils; plant specimens: 160,000	Total of 198 456 plant specimens imaged in the first half of 2024/25. 890 vertebrates and fossil specimens imaged at Ditsong, Iziko and SAIAB.
	-Digitisation of archival documents related to collections: 100 documents	308 documents imaged at National Herbarium, SANBI.
	Tracking system for monitoring and recording use of the images, and digitized documents	Initial research for online digital assets tracking commenced.
4. Research Outputs and Impact	- 100 publications produced by researchers using collections - 80 new species described from the collections - 100 scientists visiting the collections for research purposes - 50 loans of specimens sent out for research - 20 MSc, PhD and Postdocs using collections for their research - use of collections for identification of biological specimens	April to September 2024: -67 papers published -60 new species described -562 national visitors -114 international visitors -3,797 specimens sent out on loan -152 postgraduate students using the collections -1,378,528 specimens identified
	- Framework developed for assessment of use and impact of research outputs from collections	Session with community to get input on framework planned for third quarter.
5. Outreach and Communication	- Pilot video on collections and iconic specimens	Planning document developed, to undergo consultation process.

Strategic Objective	2024/25 Deliverables	Progress 1 April to 30 September 2024
	- Promote NSCF at outreach events	Science awareness outreach in the Vhembe East and West education districts of Limpopo Province hosted by Nelson Mandela University (NMU) and the University of Venda (UNIVEN). Date: 6-10 May 2024. Audience: grade 10-12 learners. A total of 1338 learners were reached.
	- Maintenance and regular posts of news items on the NSCF website and Facebook page	Website and Facebook page maintained with current information and news items, weekly updates.
	- Monitoring and analysis of views and visitors to online platforms	Website views: 190,217 Website visitors: 103,691 Facebook page followers: 1,020 Instagram followers: 273 Twitter (X) followers: 251 LinkedIn followers: 134 Facebook group members: 449 WhatsApp group members: 145
6. African and International Engagement	- Participation in international conferences, Specify Software Consortium	-4 hub members and 3 staff from partner institutions attended the Society for the Preservation of Natural History Collections and Biodiversity Information Standards joint conference virtually from 2 to 6 September. Presented on the collections assessment process. - Specify consortium country membership renewed and participated in committee meetings (Technical Advisory Committee).
	- Assess interest from African institutions in NSCF activities	Planned for the third quarter. List of possible contacts compiled.
Governance & Networking	- Meetings of Advisory Committee (twice a year); Co-ordinating Committee (3 times a year)	Advisory Committee meeting held in July 2024, Coordinating Committee meeting held in August 2024, various engagement sessions held with Directors of institutions and managers of collections during the collections assessment process.
	- Six monthly and final report to DSI; quarterly report to SANBI EXCO / Board.	Six monthly reports submitted to DSI, and quarterly reports submitted to SANBI (EXCO/Board).
	- Develop new Collaboration Agreements / addenda with partner institutions.	New collaboration agreement with DNSM developed, agreement with new partner

Strategic Objective	2024/25 Deliverables	Progress 1 April to 30 September 2024
		SANParks finalised, agreements with other partners come to an end in February 2025 and process for renewals will be initiated in the third quarter.
Enabling Strategy: Capacity Development Organisational Strengthening and Transformation	- Participation in online training course in collection management and curation for 2 NSCF Hub staff	-2 hub staff completed online international training course on collections management hosted by Transcending Science in April 2024
	- Emerging leaders development (32 staff from participating institutions and the NSCF Hub).	- First Emerging Leaders session held in Cape Town from 8 to 12 April, with 28 participants from participating institutions and the hub.
Enabling Strategy: Staffing	- Team and individual development of the NSCF Hub and project-related staff: 17 staff	-Specimen Photographer attended Digital Imaging for Biodiversity Collections Course hosted by the iDigBio Digitisation Academy from 9 to 12 July. -Hub members attended various symposia, community engagements and conferences in science communication, Living Atlas of Australia training and optical text recognition.
	- Participating institutions: Approx. 20 short term contracts (up to 6 months) and internships for recent graduates / to develop capacity and assist with curation activities / data capture and digitisation; 4 Curation Technicians to assist with integration of orphan collections; imaging of type specimens, imaging of plant specimens, digitisation of documents.	-3 short term research assistants were employed to assist with imaging of herbarium plant specimens at partner institutions. -2 curation technicians at Moss Herbarium, Wits, to incorporate Buffelskloof collection, 2 specimen photographers at SAIAB to image type specimens, 1 specimen photographer at Iziko and 1 at Ditsong to image vertebrate and fossil type specimens
Enabling Strategy: Transformation and Organisational Development	- Interventions at selected institutions to support organisational strengthening	New contract with organisational development consultants started in October 2024 for a two and a half year period and planning for interventions at institutions underway
	- NSCF Forum for staff from 17 participating institutions (140 staff)	Planned for February 2025
	- Communication platforms for the NSCF network – website, Facebook page, WhatsApp group.	Website, WhatsApp group, Facebook page and group, Instagram and Twitter accounts operational, news circulated via mailing list regularly, on an adhoc basis.

4. Financial analysis

Income:

The grant for the 2023/24 financial year was transferred to SANBI's bank account in June 2023. The **total project income to date is R124,204,289.**

Expenditure to date is R128,840,566:

- Human Resources and support services costs amounted to R55,879,600.
- Non HR Operational Costs totalled R40,577,805.
- Capital Expenditure amounted to R32,383,162 which included payments to collaboration partners for the purchase of freezers, microscopes, x-ray machine, ethanol recycler, dehumidifiers, cabinets, compactor shelving and small items for curation of collections and research. This also included procurement of imaging equipment for specimen photography and archival document digitisation.

We have accrued R6,893,153 in interest to date.

5. Financial information

A detailed financial report for the project (provided by SANBI's Finance Division and approved by the Director, Finance), is provided. This report forms the basis of the financial information presented below on income, expenditure and commitments for the 2021/22, 2022/23, 2023/24 financial years, and April to September 2024:

Budget vs Expenditure:

Period: 2024/2025

Description	Budget Allocation				Actual			
	2021/22	2022/2023	2023/2024	TOTAL	2021/22	2022/2023	2023/2024	2024/2025
Opening Balance				-	10 442 626	13 624 648	6 574 310	9 511 310
Opening Balance					10 954 433	13 611 316	6 619 185	9 511 310
Prior period adjusted					-511 807	13 332	-44 875	
Income	18 971 020	19 065 285	18 215 100	56 251 405	19 461 402	10 597 974	19 371 919	338 998
Grant	18 971 020	19 065 285	18 215 100	56 251 405	18 971 020	10 000 000	18 215 100	
Interest earned					490 382	597 974	1 156 819	338 997.65
Expenditure	18 971 020	19 065 285	18 215 100	56 251 405	16 292 712	17 603 438	16 434 919	7 593 432
Human Resources and Support Services	10 177 850	11 834 252	12 473 363	34 485 465	9 721 849	9 979 051	8 674 183	5 595 672
Operational Expenditure	5 171 789	5 331 033	5 041 737	15 544 559	3 297 371	5 105 937	5 951 283	1 843 060
Training & research support (including workshops)	1 348 320	1 400 000	1 326 610	4 074 930	34 456	79 810	93 348	246 275
Fixed annual operational cost	50 000	690 000	1 037 140	1 777 140	702 160	1 477 577	1 322 552	43 133
Travel & accomodation	760 000	471 769	590 000	1 821 769	208 238	1 108 689	1 672 725	705 785
Consumables for office, collections upgrades	1 116 449	862 736	266 477	2 245 662	455 416	1 439 861	1 041 148	847 866
SANBI overheads charge (10%)	1 897 020	1 906 528	1 821 510	5 625 058	1 897 102	1 000 000	1 821 510	
Capital Investments	3 621 381	1 900 000	700 000	6 221 381	3 273 492	2 518 449	1 809 453	154 700
Webservers & networking	3 470 070	1 300 000	500 000	5 270 070	3 273 492	2 518 449	1 809 453	154 700
Equipment				-				
Workstations	151 311	600 000	200 000	951 311				
Closing balance					13 611 316	6 619 185	9 511 310	2 256 876
Less total interest accumulated to dated								- 6 893 153
Total balance as at 30.09.2024								- 4 636 277

Financial summary:

Total Project Income	R124,204,289
Total Project Expenditure	R128,840,566
Balance	-R4,636,277 deficit

*R6,893,153 interest earned not included in the table above

Details of financial commitments:

There are several commitments at various stages of finalisation, and with various actions that are required before payments can be transferred from SANBI's accounts. These are commitments against signed staff contracts, and service provider contracts for which the project is obliged by SANBI to keep the committed funds in the project cost centre. Commitments against actual signed contracts are detailed in the table below.

Salary costs, contracts and agreements (committed through contracts, and required to be retained in cost centre by SANBI)

Item	Expected date of finalisation	Amount
Short term contract staff at institutions (research assistants)	January 2025	R96,000
Service provider for website maintenance and technical support	May 2026	R201,820

Service provider for organisational transformation and development process	March 2027	R3,880,395
Collaboration agreement with LepSoc	September 2024	R30,000
TOTAL		R4,208,215

Staff contracts for 21 NSCF Hub staff appointed at SANBI and at institutions(dependent on funding)

Item	Expected date of finalisation	Amount
Staff contracts	March 2027	R23,247,522
TOTAL		R23,247,522

6. Summary and assessment

Achievements 1 April to 30 September 2024:

1. Integrated monitoring of outputs from the use of the collections has been carried out, and illustrates the value of the collections as research infrastructure: figures for April to September 2024: 184 requests for data serviced, with 28,220 specimen records provided; 562 national visitors and 114 international visitors using the collections; 60 new species described using the collections; 67 peer-reviewed papers published where the collections were used; the number of postgraduate students who used the collections was 152 (note that the same student may be counted more than once if they used more than one institution's collections). Seventeen institutions submitted reports through the online monitoring system. Institutions reported the following outputs for the first 6 months of the financial year:

Indicator	Q1	Q2	Year Total
Orphan collections: no. of specimens incorporated	533	2804	3337
New specimens accessioned	28754	68111	96865
Number of DNA samples added	40	31	71
Number of tissue samples added	162	266	428
Number of DNA samples supplied for research purposes	251	648	899
Data provided to external users: no. of requests	96	88	184
Data provided to external users: no. of records	15520	12700	28220
Number of new specimen records added to Brahms/Specify	8980	11208	20188
Number of specimens imaged	482	41455	41937
Number of specimens sent out on loan for research	876	2921	3797
Number of visitors using collection (national)	181	381	562
Number of visitors using collection (international)	33	81	114
Number of new species described	30	30	60
Number of papers published based on collection	20	47	67
Number of papers open access	7	22	29
Number of specimens identified: external stakeholders	1299240	79288	1378528
Number of outreach activities held	87	63	150
Number of learners/attendees exposed to the activity	7945	5165	13110
Number of postgrad students using the collection	79	73	152
Number of students trained in the collections	58	7	65
Number of students graduated from using the collections	3	7	10

These figures illustrate the extensive use of the collections and associated services, and the high number of outputs.

2. Translational outputs: the collections are used as a reference for the identification of materials in agriculture (crop pests, livestock disease vectors and parasites, weed biocontrol agents, phytosanitary diagnostics for import and export of produce), **health** (eg. outbreak of head lice at a school), **environmental impact assessments** for development applications, postgraduate studies and for researchers in a number of different disciplines, and for the general public: 1,378,528 specimens have been identified for the first half of the 2024/25 financial year. The impacts of not having the correct identification include the loss of crops and livestock, or a global ban on export of produce, and delays in approvals for development applications or the loss of biodiversity through development.

3. Outreach activities were held as follows:

The NSCF was invited by UNIVEN and NMU to the annual science awareness outreach event in the Vhembe East and West education districts of Limpopo Province, from 6-10 May 2024. The outreach was aimed at grade 10-12 learners to inform them about careers in science, and the value of natural science collections to society. Short talks were shared with the learners, with some specimens on the table, to make the information more understandable and relatable. A total of 1338 learners were reached. The technicians appointed through the NSCF at WITS-Moss Herbarium and at SAIAB are actively involved in school group tours of the collections.



NSCF awareness outreach in the Vhembe East and West education districts of Limpopo Province

4. National Collections Assessments/Iqoqwana Initiative:



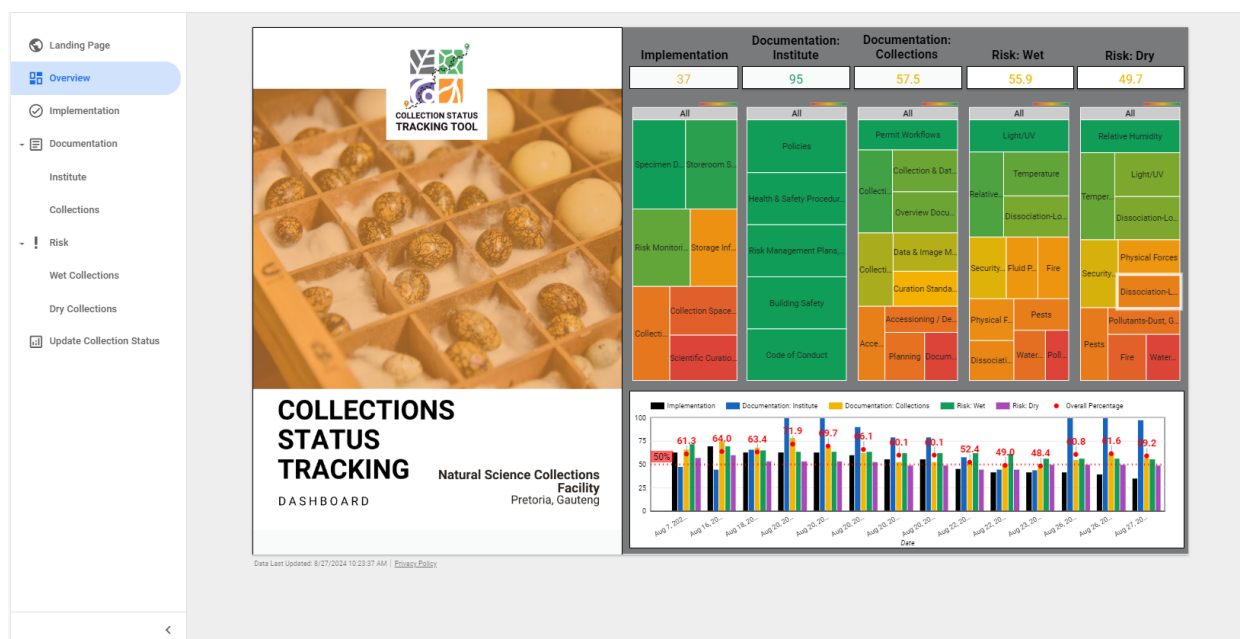
Over the last five years funds have been allocated to partner institutions to upgrade research and curation infrastructure and practice, and support has been provided for various collection activities including data capture and management, imaging of specimens, and movement and integration of orphan collections. The Collection Management and Conservation Manual was published and disseminated in early 2021, an outcome of a collaborative effort bringing together collection institutions. This Manual serves as a guide, providing standards, procedures and templates that align with best professional practice as well as audit principles. A Collections Management Course was developed based on the Manual to build capacity and provide further guidance and support for implementation. With over R100 million of investment in the NSCF by the Department of Science & Innovation over the past five years, an assessment of the state of our natural science collections was required.

Working with developmental and transformation facilitators a process of facilitated self-assessment, self-reflection on what is revealed by the assessment, and collaborative learning and support across the network through the process and into the future was proposed. The facilitated self-assessment concept received support from the NSCF Advisory Committee and from the Co-ordinating Committee, as well as from the Directors of the partner institutions.

The facilitated self-assessment process was aimed at providing support for the future of natural science collections in South Africa, but also for transformation, building staff capacity, and creating a collaborative learning and vibrant environment that will ensure sustainability. Several engagements were held with the community in order for the assessments to be based on collaborative planning, organisational learning and principles of inclusivity, participation and capacity building. As mentioned, engagements were held with the Advisory and Coordinating Committees of the NSCF, as well as the Directors of the institutions. The annual NSCF Forum which is open to the entire community was designed around onboarding all levels of staff at institutions to the assessment process, and collaborative design of the assessments. The forum was held online from 25 to 28 October 2022 and attended by between 60 and 120 participants for various sessions. Regional orientation sessions were held during March 2023.

Partner institutions conducted self-assessments of their collections in April and early May 2023. These assessments were moderated on-site by the NSCF hub team and observers from other partner institutions during site visits in May, June and July 2023. A total of 78 collections were moderated by the hub team. The collation of the assessment data and the production of feedback reports for institutions as well as individual collections were completed and distributed to institutions in January and February 2024. An overall status report was compiled and distributed to institutions in June 2024, and a summary status report was shared with the NSCF Advisory Committee in July 2024. Sense-making workshops were held with institutions to discuss the findings of the assessments and work on plans for improvement and future support. The hub team will continue to work with institutions to address the recommendations and gaps identified from the assessments through **Communities of Practice**.

In addition, a **Collections Status Tracking** Tool was developed by the hub team to assist institutions in tracking progress with implementation of collections and data management practices and standards from a baseline situation based on the result from the collections assessments.



Collection Status Tacking Tool Interface

5. Emerging Leaders Development

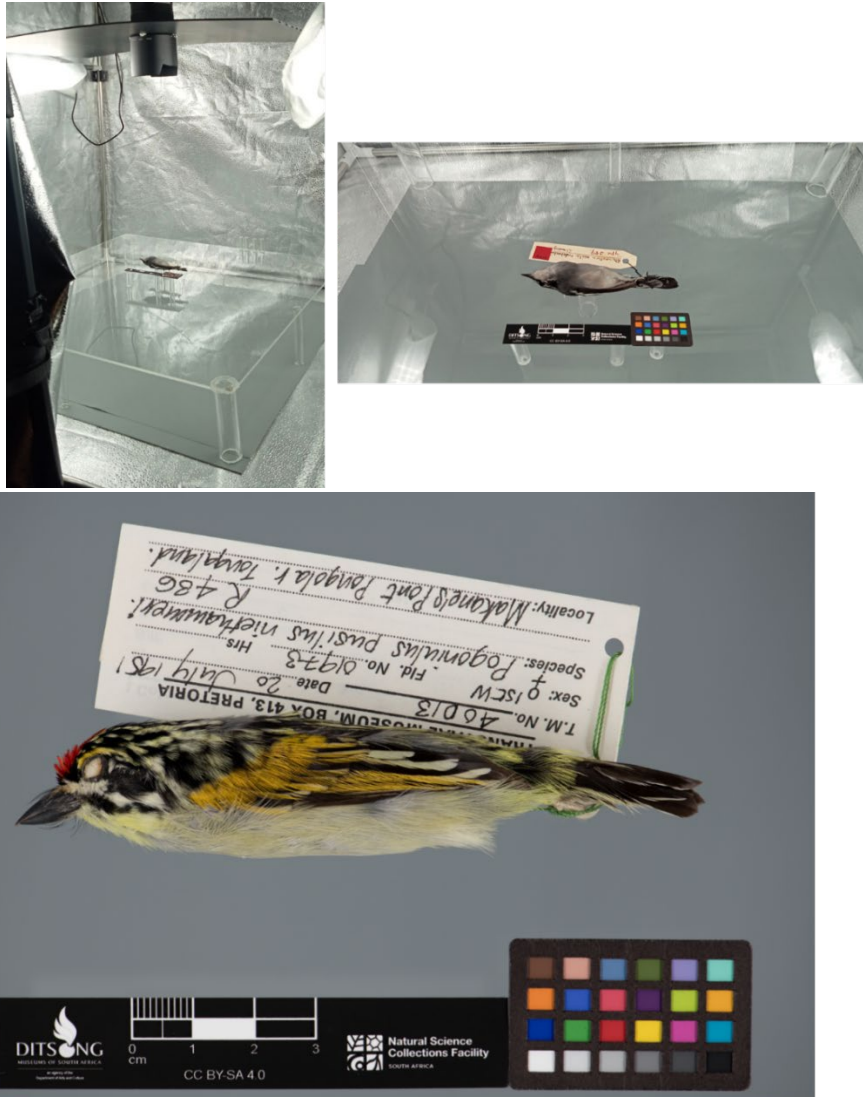
Working with the outcomes of the assessments and implementation of standards and SOPS across institutions requires that new ways of working are designed and piloted, and through a reflective process, revised or modified, taking into account each institution's unique challenges, culture and background but also the need to work as a community of practice. The previous transformation contracts have highlighted the important role that emerging young leaders within the institutions play in effecting change, and development of this community will be an imperative for this phase of the NSCF. The first session with 26 participants from partner institutions and the NSCF hub was held in Cape Town from 8 to 12 April 2024. The session was facilitated by the Organisational Development consultants and covered topics on complexity leadership applied to the NSCF context, competencies for driving change and social technologies for transformation, and participation in communities of practice for capacitation of natural science collection in South Africa.



Emerging Leaders session held in Cape Town from 8 to 12 April 2024

6. Digitisation of specimens and archival documents for the Virtual Museum

The imaging of herbarium specimens at herbaria across the country has continued with a total of 198 456 plant specimens imaged in the first half of 2024/25. 891 vertebrates and fossil type specimens were imaged at Ditsong National Museum of Natural History, Iziko South African Museum and the South African Institute for Aquatic Biodiversity. 308 archival documents (collectors registers, field notes, collection accession registers) were imaged at the SANBI National Herbarium.



Red-fronted tinkerbird (*Pogoniulus pusillus*)

Imaging station setup and image of bird type specimen at Ditsong Museum

Challenges:

1. Operational Challenges. Recruitment of staff, procurement, signing of collaboration and other agreements are all through SANBI systems and getting the required authorisations and support has resulted in significant delays with many activities.

The NSCF is considered as a project within a Division of SANBI, which means that authorisation for agreements, procurement and staffing is often through between four and six signatories above the level of the NSCF Lead. Procurement processes are often very long, with even small items taking up to six months to procure and there have been long periods when computer hardware could not be procured. There is one opportunity per annum to include items over R1 million on the procurement plan. Recruitment processes can take as long as a year, and the minimum requirements and post level are specified by SANBI and not by the NSCF. All these challenges mean that significant efforts are required from most activities and there are delays in implementation of some activities.

2. Cash flow challenges: We are required to retain sufficient funds in the cost centre to cover the full cost of all contracts, including collaboration agreements for institutions and staffing. This results in funds being tied up in two to three year contracts, but we are required by DSI to spend 90% of funds before the next allocation can be drawn.

3. Fostering a culture of serving society and accountability in institutions and staff, many of who have previously had a predominantly inward looking and self-serving approach to the collections and research. The new Organisational Development contract will focus on institutional level interventions and working with emerging leaders in institutions.

4. Development of an online virtual museum, Initially integration with SANBI's National Biodiversity Information System was planned. However delays with the implementation meant that an alternative arrangement was required. Living Atlas software (open source) will be used and we have filled a post for virtual museum setup and coordination.

5. NSCF Leadership: Prof Michelle Hamer, the NSCF Lead, is retiring at the end of October 2024. SANBI advertised the lead post, as a 3-year contract, but was unable to find a suitable candidate. The post was re-advertised. Hub staff are able to implement the Business Plan in the absence of a NSCF Lead as an interim measure.

Approval

Submitted by:



Prof Michelle Hamer

DSI-SARIR Projects Lead

Date: 22 October 2024

Approved by:



Prof Ramagwai Sebola

Chief Director, Foundational Biodiversity Science

Date: 28/10/2024